

**FIRST FIVE-YEAR REVIEW REPORT  
ICELAND COIN LAUNDRY SUPERFUND SITE  
CUMBERLAND COUNTY, VINELAND, NEW JERSEY**



**Prepared by**

**U.S. Environmental Protection Agency  
Region 2  
New York, New York**

**July 2014**

**Approved by:**

A handwritten signature in dark ink, appearing to read "Walter E. Mugdan", is written over a horizontal dashed line.

**Date:**

The date "7/31/14" is handwritten in dark ink over a horizontal dashed line.

**For** **Walter E. Mugdan, Director**  
**Emergency and Remedial Response Division**

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## **Executive Summary**

This is the first five-year review for the Iceland Coin Laundry Superfund site located in City of Vineland, Cumberland County, New Jersey. The purpose of this five-year review is to review information to determine if the remedy is and will continue to be protective of human health and the environment. The triggering action for this policy five-year review was the Preliminary Close-Out Report signed on September 27, 2007.

The implementation of the selected remedy is not yet complete. There is no unacceptable exposure to contaminants. Additional treatment injections followed by routine monitoring of the groundwater quality are necessary to further evaluate the effectiveness of the selected remedy. In addition, the required Classification Exemption Area (CEA) to prevent the installation of potable wells within the contaminated groundwater plume needs to be put in place.

## Five-Year Review Summary Form

SITE IDENTIFICATION		
<b>Site Name:</b> Iceland Coin Laundry		
<b>EPA ID:</b> NJ0001360882		
<b>Region:</b> 2	<b>State:</b> NJ	<b>City/County:</b> Vineland/Cumberland
SITE STATUS		
<b>NPL Status:</b> Final		
<b>Multiple OUs?</b> No	<b>Has the site achieved construction completion?</b> Yes	
REVIEW STATUS		
<b>Lead agency:</b> EPA <i>[If "Other Federal Agency", enter Agency name]:</i> Click here to enter text.		
<b>Author name (Federal or State Project Manager):</b> Michael Zeolla		
<b>Author affiliation:</b> Remedial Project Manager		
<b>Review period:</b> 9/27/2007 - 9/27/2014		
<b>Date of site inspection:</b> None		
<b>Type of review:</b> Policy		
<b>Review number:</b> 1		
<b>Triggering action date:</b> 9/27/2007		
<b>Due date (five years after triggering action date):</b> 9/27/2014		

Sitewide Protectiveness Statement	
<b>Protectiveness Determination:</b> Short-term Protective	<b>Addendum Due Date (if applicable):</b> Click here to enter a date.
<b>Protectiveness Statement:</b> The remedy at OU1 is protective of human health and the environment because no one is using contaminated groundwater and the remedy is reducing the contaminant concentrations within the plume. In the interim, remedial activities completed to date have adequately addressed all exposure pathways that could result in unacceptable risk.	

## **Introduction**

The purpose of a five-year review is to evaluate the implementation and performance of a remedy in order to determine if the remedy is and will continue to be protective of human health and the environment and is functioning as intended by the decision documents. These methods, findings, and conclusions are documented in the five-year review. Also, five-year review reports identify issues found during the review, if any, and document recommendations to address them.

This is the first five-year review for the Iceland Coin Laundry site (site), located in Vineland, Cumberland County, New Jersey. This five-year review was conducted by the United States Environmental Protection Agency (EPA) Remedial Project Manager (RPM) Michael Zeolla. The review was conducted in accordance with the *Comprehensive Five-Year Review Guidance*, OSWER Directive 9355.7-03B-P (June 2001). This report will become part of the site file.

This review is shorter and less detailed than a standard five-year review because implementation of the contaminated groundwater remedy is still underway. The sections of a standard five-year review eliminated from this review are as follows: site chronology; progress since last five-year review; five-year review process; and, the attachment of data.

The triggering action for this policy review is the signature date of the Preliminary Close-Out Report. A five-year review is required at this site due to the fact that the remedial action will not leave hazardous substances, pollutants or contaminants on site above levels that allow for unlimited use and unrestricted exposure, but requires five or more years to complete. The site cleanup is being addressed in a single operable unit, which is addressed in this five-year review.

## **Background**

### *Physical Characteristics*

The site includes the former Iceland Coin Laundry and Dry Cleaning facility (former Iceland facility), at 1888 South Delsea Drive, in the City of Vineland, Cumberland County, New Jersey, and the associated contaminated groundwater plume to the south/southwest of the former Iceland facility. The contaminated groundwater plume area encompasses South Delsea Drive, Garrison Road, Lois Lane, South Orchard Road, West Elmer Road, and West Korff Drive.

The former Iceland facility consists of a 13,000 square foot, one-story building and adjacent parking areas on approximately 1.4 acres (Figure 1). A concrete pad is located in the northwest corner of the property, behind the building. The current property owners began operating a retail appliance and jewelry store in October 1997. To the west of the site is a mobile home park, to the south are houses and some small commercial buildings. There is a used car sale lot to the north and a vacant property once used as an automobile repair shop across Delsea Drive to the east. Adjacent to the vacant property on the east side of Delsea Drive is a New Jersey Department of Transportation (NJDOT) facility.

### *Site Geology/Hydrogeology*

The site is located in the southern part of the New Jersey Coastal Plain and is drained by tributaries of the Maurice River. The Coastal Plain may be characterized as a sequence of unconsolidated sands, silts, and clays that dip and thicken to the southeast. The project area is underlain by the Cohansey Sand, with the overlying Bridgeton Formation present locally. These

units, as well as the overlying soils, are typically sandy, highly permeable, and low in organic matter and calcium carbonates. Slopes in the area are low, with surface elevations between 60 and 100 feet above mean sea level (amsl). The site is relatively flat; the elevation is just under 70 feet amsl at the former Iceland facility and rises to just above 100 feet amsl south of the residential wells that were sampled in the early 1990s.

The principle aquifers of the New Jersey Coastal Plain are the Kirkwood-Cohansey aquifer system, the Atlantic City 800-foot sand of the Kirkwood Formation, the Wenonah Laurel aquifer, the Englishtown aquifer system, and the Potomac-Raritan-Magothy aquifer system. There are also many minor water-bearing zones locally.

#### *Land and Resource Use*

The former Iceland facility was utilized by the Vineland Fruit and Poultry Farms Association from 1930 to 1953 and then by the Iceland Coin Laundry and Dry Cleaning from 1953 to 1971. An ice skating rink was present in the building from 1955 to 1965. The building was then leased, in succession, to an unknown party for teenage dances, to Royal Crown Beverages for storage, and to Owens-Illinois for storage. The property was sold in 1972.

Since 1972, the building was occupied by Anastasi Carpets (carpet sales), South Jersey Paper Company (party favor sales), Buena Plumbing (pipe storage), and Kelly Carpet (carpet sales). No manufacturing operations were conducted on the property. In July 1997, the property was sold to the current owners who are operating a retail appliance and jewelry store since October 1997.

#### *History of Contamination*

The former Iceland facility operated from approximately 1953 until at least 1971. Limited information is available regarding waste disposal areas and systems. Four coin-operated dry cleaning units of eight-pound capacity were present in the laundry facility, each using four gallons of tetrachloroethene (PCE). It is not known how often the PCE was refilled.

No waste/sludge was reportedly generated, since the PCE evaporated. The lint filters from the dry cleaning units were allegedly burned outside in the back of the building.

Two 14-foot deep seepage pits/cesspools with a 40-foot drain field between the pits were used beginning in 1962. According to the former owner, the cesspools were located in the front of the building. Septic system design drawings from 1963 indicate effluent from 10 washers discharged to a septic tank, continued through a 100-foot field drain, and terminated at a 4-foot diameter receptor vessel. The property was connected to the sanitary sewer in 1986.

#### *Initial Response*

On September 3, 1987, the City of Vineland Health Department collected a potable well sample, in which trichloroethene (TCE) was detected. From December 1990 to September 1991, the City of Vineland Health Department collected potable well samples from 55 residences located in the area of Garrison Road and West Korff Drive. Analytical results from these sampling activities revealed levels of volatile organic compounds (VOCs) and mercury above federal and state MCLs in 21 of the 55 well samples. The primary contaminants were PCE, TCE, cis-1,2-dichloroethene (cis-1,2-DCE), and mercury. The well detected with mercury was subsequently resampled and mercury was not detected.

In November 1991, the New Jersey Department of Environmental Protection (NJDEP) installed point-of-entry treatment (POET) units at 21 residences as a temporary remedial measure. By July 1994, the Vineland City Water Department had extended public water connections to these residences. By December 2003, four residential wells were still in use; three were used for irrigation only and one was still used for drinking water. One owner refused to be connected to public water and had a POET system installed.

The site was placed on the U.S. Environmental Protection Agency's (EPA's) National Priorities List in October 1999.

### *Basis for Taking Action*

From June 2002 to December 2003, EPA performed a remedial investigation and feasibility study (RI/FS), which included both a source area and groundwater investigation. The results of the source area investigation indicated only minor detections of contaminants, that the contaminants likely do not remain within the unsaturated soil zone, and only residual levels of contamination remain in on-site soils. The baseline human health risk assessment (BHHRA) concluded that soils contamination does not present an unacceptable risk to current or future residents, workers at the site, or visitors to the site. The groundwater investigation indicated that the core of the PCE and TCE plume has migrated vertically downward and horizontally to the south and southwest, and that residual contamination remains localized in and around the former Iceland facility. The plume extends approximately 4,700 feet south/southwest from the former Iceland facility, and is about 900 feet in width. The BHHRA concluded that groundwater posed an unacceptable risk from potential ingestion and inhalation of PCE and TCE.

An ecological risk assessment was also conducted for the site. This assessment concluded that there were no ecological receptors or habitat identified at the site. As a result, a Screening Level Ecological Risk Assessment (SLERA) was not required.

## **Remedial Actions**

### *Remedy Selection*

Based on the findings in the RI/FS, a Record of Decision (ROD) selecting in-situ biological treatment to remediate the groundwater plume was issued by EPA in September 2006. The remedy selected addresses contaminated groundwater migrating from the former Iceland facility and extending approximately 4,700 feet to the south/southwest. The primary groundwater contaminants are PCE, and its breakdown products, TCE and cis-1,2 DCE.

The risk assessment identified the contaminants of concern (COCs) for groundwater. The most significant impact from the site is due to the presence of PCE and TCE in groundwater. Site groundwater is designated as Class II-A, which is potable groundwater with conventional water supply treatment. The remedial action objectives (RAOs) for groundwater at the site are as follows:

- Prevent ingestion of, and dermal contact with, contaminated groundwater having concentrations in excess of cleanup criteria

- Restore the groundwater aquifer system to the cleanup criteria within a reasonable timeframe; and
- Prevent vapor intrusion of the VOCs into the Facility or buildings at the source area.

For groundwater, PCE, TCE, and cis-1,2-DCE are the COCs and the remediation goals (RGs) for these contaminants set in the 2006 ROD are as follows; PCE at 1ppb; TCE at 1 ppb; and cis-1,2-DCE at 70 ppb.

However, no COCs were present above screening criteria in soils. As a result, no RAOs were developed for soils at the site.

The major components of the remedy include:

- In-situ biological treatment for cleanup of the groundwater at the Iceland Coin Laundry Site. The in-situ treatment will be an enhanced anaerobic bioremediation (EAB) system.
- In addition, enhanced anaerobic biological treatment at the facility area, if necessary. If the design investigation indicates significant soil contamination adjacent to the source area, EAB will also be performed in this area.
- EAB performance monitoring - Monitoring wells would be sampled to ensure that the conditions inside and along the edges of the contaminated area are conducive to biodegradation.
- Institutional controls for groundwater would include a Classification Exception Area (CEA) and well drilling restrictions to eliminate human exposure pathways to contaminated groundwater.
- Long-term groundwater monitoring program to track contaminant concentration changes and migration outside the treatment area. The monitoring will be conducted to establish whether contaminants are meeting the appropriate New Jersey Ground Water Quality Standards (NJGWQSs) or Maximum Contaminant Levels (MCLs), whichever are lower.
- If residences or businesses within the aerial extent of the site plume are found to have not yet been connected to public water, EPA would consider connecting them to the public water supply.

### *Remedy Implementation*

The remedial design and well network installation was completed in September 2007. The remedy was implemented in two separate areas; the former facility and the plume (treatability study) area. The following activities were conducted at the former facility area:

- Five injection and 7 monitoring wells were installed in two phases; April and July 2007. The injection wells formed two treatment zones.
- One round of amendment using emulsified vegetable oil was successfully injected into the five injection wells in two phases; May and August 2007.



- Due to the low pH value in groundwater, potassium carbonate solution was injected into the groundwater together with the amendment solution at two of the five injection wells.
- Two rounds of samples were collected from the injection and monitoring wells; Baseline in May and July 2007 and Round 1 in September 2007.

The following activities were accomplished at the treatability study area:

- Four injection and 13 monitoring wells were installed in March and April 2007.
- One round of amendment using emulsified vegetable oil was successfully injected into the four injection wells in April 2007.
- Due to the low pH value in groundwater, sodium bicarbonate solution was injected into the groundwater at three of the four injection wells in June 2007.
- Dehalococcoides spp. (DHC) bacteria was injected into three of the four injection wells in June 2007.
- Six rounds of samples were collected from the injection and monitoring wells; Baseline (in April 2007); Round 1 (in May 2007); Pre pH Adjustment (in June 2007); Round 2 (in July 2007); Round 3 (in August 2007); and Round 4 (in September 2007).

The following conditions for anaerobic biodegradation through reductive dechlorination were observed during monitoring of the groundwater in some injection wells at the treatment areas:

- Depletion of oxygen and nitrate concentration, indicating groundwater conditions have become anaerobic.
- Reduction of oxidation-reduction potential to iron reducing conditions with generation of ferrous irons, which is a step closer to the optimum conditions for complete reductive dechlorination.
- Reduction of PCE concentrations and generation of low concentrations of vinyl chloride, which is an intermediate product of PCE dechlorination process.

The results and conclusions from these activities can be found in the Final Treatability Study Report submitted June 2008.

The implementation of the EAB treatment barrier was conducted in three stages. Stage 1 consisted of a preliminary investigation to optimize the remedy by refining the vertical and horizontal boundaries of the PCE plume. This investigation was completed in two phases. Phase 1 was conducted from April 2009 to November 2009, and included groundwater sampling from select existing monitoring wells and groundwater screening at 35 locations. Phase 2 was conducted in the summer of 2010 and included groundwater screening at 12 additional screening locations, collection of lithologic and geophysical data, and installation of 7 monitoring wells. The results of this investigation and proposed EAB treatment barrier are summarized in a Final Stage 1 Technical Memorandum submitted in August 2011.

Stage 2 consisted of the implementation of a site wide EAB barrier. This barrier was located on the east side of the Garrison Road and South Orchard Road intersection and perpendicular to groundwater flow to reduce any further migration of the PCE contaminated groundwater. The following activities were conducted under Stage 2:

- Groundwater screening at 7 locations to modify the proposed EAB barrier were completed in June 2011;
- Thirty-two injection, 14 monitoring and 3 extraction wells that formed the EAB barrier were installed from July to August 2011;
- Amendment injection at the EAB barrier and treatability study area were conducted from September to October 2011; and
- Performance monitoring of groundwater.

The injection wells were installed approximately 30 feet apart, at depths ranging from 70 to 105 feet below ground surface with 10 or 15 foot screens in length. The amendment solution consisted of emulsified vegetable oil and rapidly biodegradable soluble substrate mixed with extracted groundwater to produce a 1% concentration and injected into a total of 35 injection wells. All of the injection and extraction wells were abandoned from private properties.

Prior to amendment injection, a baseline groundwater monitoring event was conducted from August to September 2011. After amendment injection, the initial (Round1) groundwater performance monitoring event was conducted in April 2012. The details of the EAB barrier implementation and groundwater monitoring results are provide in a Round 1 Performance Evaluation Report submitted in August 2012.

Six months after amendment injection, a second groundwater performance monitoring event was conducted in November 2012. The results found that the levels of PCE concentrations at the barrier and treatability study area continue to be reduced but several areas require additional treatment. These conclusions are provided in a Round 2 Performance Evaluation Report submitted in February 2013.

One year after amendment injection, a third groundwater performance monitoring event was conducted in May 2013. The results and conclusions will be provided in a performance evaluation report to be submitted in July 2014.

During the summer of 2013, EPA extended public water connections to four additional residences after becoming aware that private wells were still being utilized within the site area. Currently, no other residences are known to be using private wells.

The next planned injection event is expected to be conducted during the spring of 2015. It will consist of the installation of additional injection and monitoring wells along with amendment injection in several areas.

## *Vapor Intrusion*

Vapor intrusion activities have been conducted at the former Iceland facility since March 2006. A total of 6 sampling events were conducted at the facility. No other properties in the area required testing due to fact that groundwater contamination sinks as it moves off site, creating a clean water barrier. The last sampling event was completed in March 2014. Overall, the results of the sub slab samples that were collected beneath the former Iceland facility show that PCE was detected above current risk based screening criteria, and that no PCE was detected in the indoor air above current levels of concern. However, during the 2013 sampling round, TCE was detected in the indoor air samples ranging from 6.51 to 8.28 ug/m<sup>3</sup>. These indoor air results did not correlate to the single TCE concentration detected in the sub slab (5.06 ug/m<sup>3</sup>) indicating an unknown indoor air source that is likely responsible for the elevated levels of TCE found in the indoor air samples.

In the most recent data collected (March 2014), PCE continues to be detected beneath the sub slab of the former Iceland facility but TCE was not detected, and the indoor air continues to show no levels of concern for PCE. However, TCE was detected at one indoor location (1.02 ug/m<sup>3</sup>). Based on the available data, the vapor intrusion pathway is not currently a concern for occupants of the former Iceland facility but periodic sampling for vapor intrusion will continue to ensure the protectiveness of human health and the environment.

## *Institutional Controls*

EPA will establish institutional controls (in the form of existing well permitting laws and regulations and the NJDEP CEA) to limit the pumping of groundwater at the Site, to prevent interference with the selected remedy, and to prevent exposure to contaminated groundwater until ROD cleanup goals are achieved.

## **Technical Assessment**

*Question A: Is the remedy functioning as intended by the decision documents?*

The contaminated groundwater is being treated through amendment injection. Preliminary data shows that contaminant concentrations are being reduced and the plume has not expanded. However, additional sampling events are needed to evaluate effectiveness. Based on the results of the subsequent sampling events, additional injection events may be conducted.

*Question B: Are the exposure assumptions, toxicity data, cleanup levels, and remedial action objectives used at the time of the remedy still valid?*

There have been no physical changes to the site that would adversely affect the protectiveness of the remedy. Land use assumptions, exposure assumptions and pathways, and clean up levels considered in the ROD followed the Risk Assessment Guidance for Superfund used by the Agency and remain valid. Although specific parameters may have changed since the time the risk assessment was completed, the process that was used remains valid.

The groundwater RAOs used at the time of the remedy selection remain valid. New Jersey groundwater quality standards (NJ GWQS) were selected as cleanup criteria for the site COCs (which include PCE, TCE and cis-1, 2-DCE). The NJ GWQS have not changed for the three site COCs since the signing of the ROD and they too remain valid.

The BHHRA determined that potential risk from soils available for direct contact did not exceed unacceptable levels; however, exposure to contaminated groundwater beneath the site would result in unacceptable risk to the current and future child/adult resident and site worker. All residents in the vicinity of the Site have been connected to the public water supply, eliminating the groundwater exposure pathway. In addition, to ensure vapor intrusion into indoor air isn't a completed pathway, sub slab and indoor air samples have been collected from the onsite facility since 2006. A review of the data indicate elevated concentrations of PCE continue to be detected beneath the slab of the onsite building, however indoor air detections of PCE are well below levels of concern. To ensure the remedy remains protective, periodic vapor intrusion sampling will continue at the former onsite facility.

The plume does not discharge to any water bodies so ecological risks are still not a concern at the site.

*Question C: Has any other information come to light that could call into question the protectiveness of the remedy?*

No information has come to light that could call into question the protectiveness of the remedy.

#### *Technical Assessment Summary*

The injections conducted to date have resulted in a decrease in PCE concentrations in groundwater. The plume is stable. Additional sampling events are needed to evaluate remedy performance. If sampling data indicates the need for additional amendments in the surface, additional injections will be conducted.

#### **Issues, Recommendations and Follow-Up Actions**

The CEA has not been put in place. EPA will work with the State to establish the CEA.

#### **Protectiveness Statement**

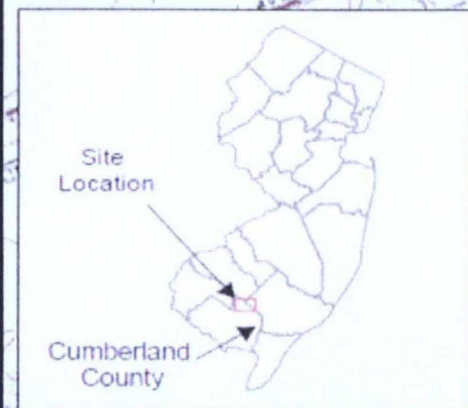
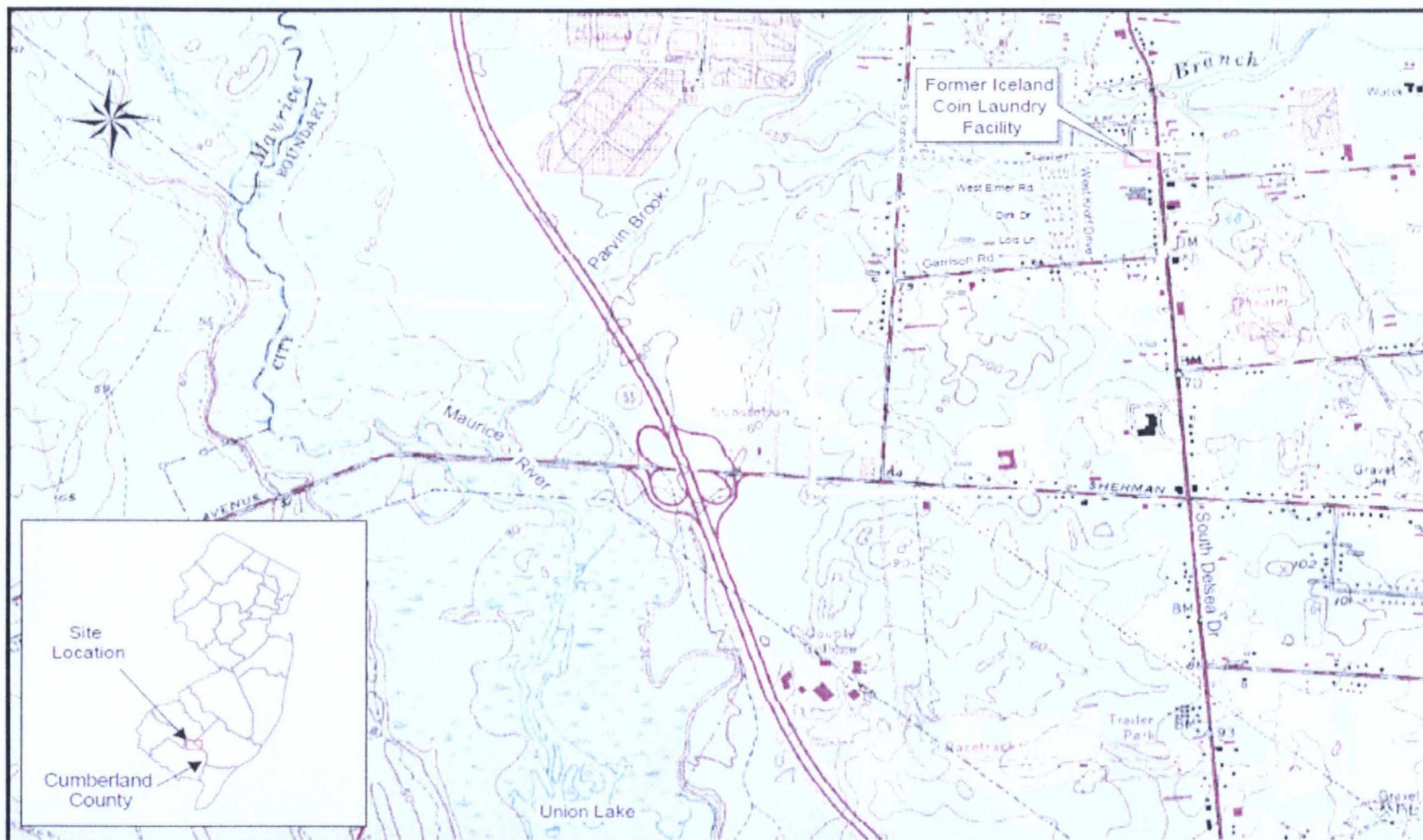
The remedy at OU1 is protective of human health and the environment because no one is using contaminated groundwater and the remedy is reducing the contaminant concentrations within the plume. In to be protective in the long term, the CEA needs to be put in place.

#### **Next Review**

The next five-year review report for the Iceland Coin Laundry Superfund site is required five years from the completion date of this review.

#### **Attachments**

##### **Attachment 1: Figure**



Study Area

Facility Boundary

CDM  
Smith

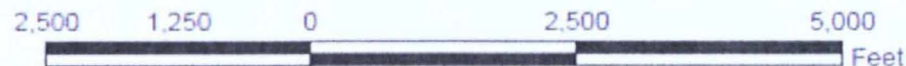
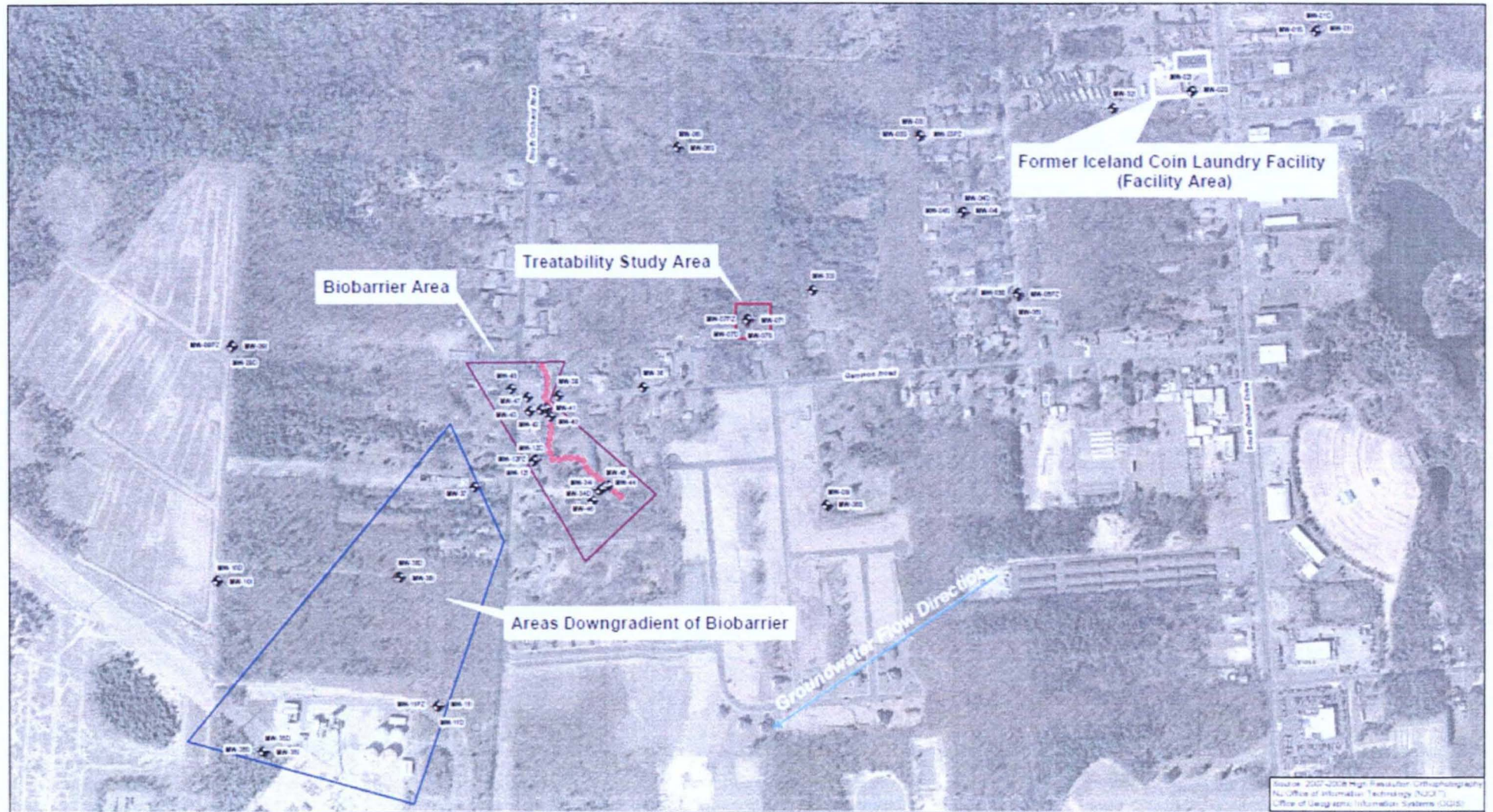


Figure 1-1  
Site Location Map  
Iceland Coin Laundry Superfund Site  
Vineland, Cumberland County, NJ





#### Legend

- Former Iceland Coin Laundry Facility (Facility Area)
- Existing Monitoring Well
- Biobarrier Injection Well
- Treatability Study Area
- Biobarrier Area
- Areas Downgradient of Biobarrier

Note  
PZ - Piezometer  
S - Shallow Well  
I - Intermediate Well  
D - Deep Well

0 250 500 1,000 Feet



Figure 1-2  
Site Areas  
Iceland Coin Laundry Superfund Site  
Vineland, Cumberland County, New Jersey

CDM  
Smith